

**APPARATUS AND METHODS FOR BLOCKING HIGHLY SCATTERED
CHARGED PARTICLES IN A PATTERNED BEAM IN A CHARGED-
PARTICLE-BEAM MICROLITHOGRAPHY SYSTEM AND METHOD**

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Abstract of the Disclosure

Apparatus and methods are disclosed pertaining to microlithography performed using a charged particle beam. In an exemplary apparatus, the

10 projection-optical system includes a first projection lens situated downstream of a pattern-defining reticle and a second projection lens situated downstream of the first projection lens. Between the first and second projection lenses is a back focal plane of the first projection lens, at which focal plane a beam crossover is formed. The projection-optical system includes a cutoff-plate assembly, including at least one

15 aperture-defining cutoff plate, located between the reticle and the back focal plane. The respective aperture in each cutoff plate is wider than an aperture in a scattering aperture conventionally located at the back focal plane. If the cutoff-plate assembly includes multiple cutoff plates, the aperture defined in the cutoff plate closer to the reticle is wider than the aperture defined in the more downstream cutoff plate. At

20 least one of the cutoff plates defines an aperture that is laterally extended in a beam-deflection direction in the projection-optical system.